

1970

**OPERATING
SUMMARY**

**MOORE TOWNSHIP
(Corunna)**

**water pollution
control plant**

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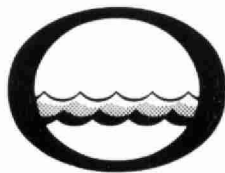
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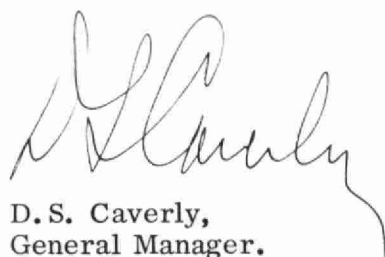
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D.S. Caverly,
General Manager.



D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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MOORE TOWNSHIP (CORUNNA)
water pollution control plant

operated for

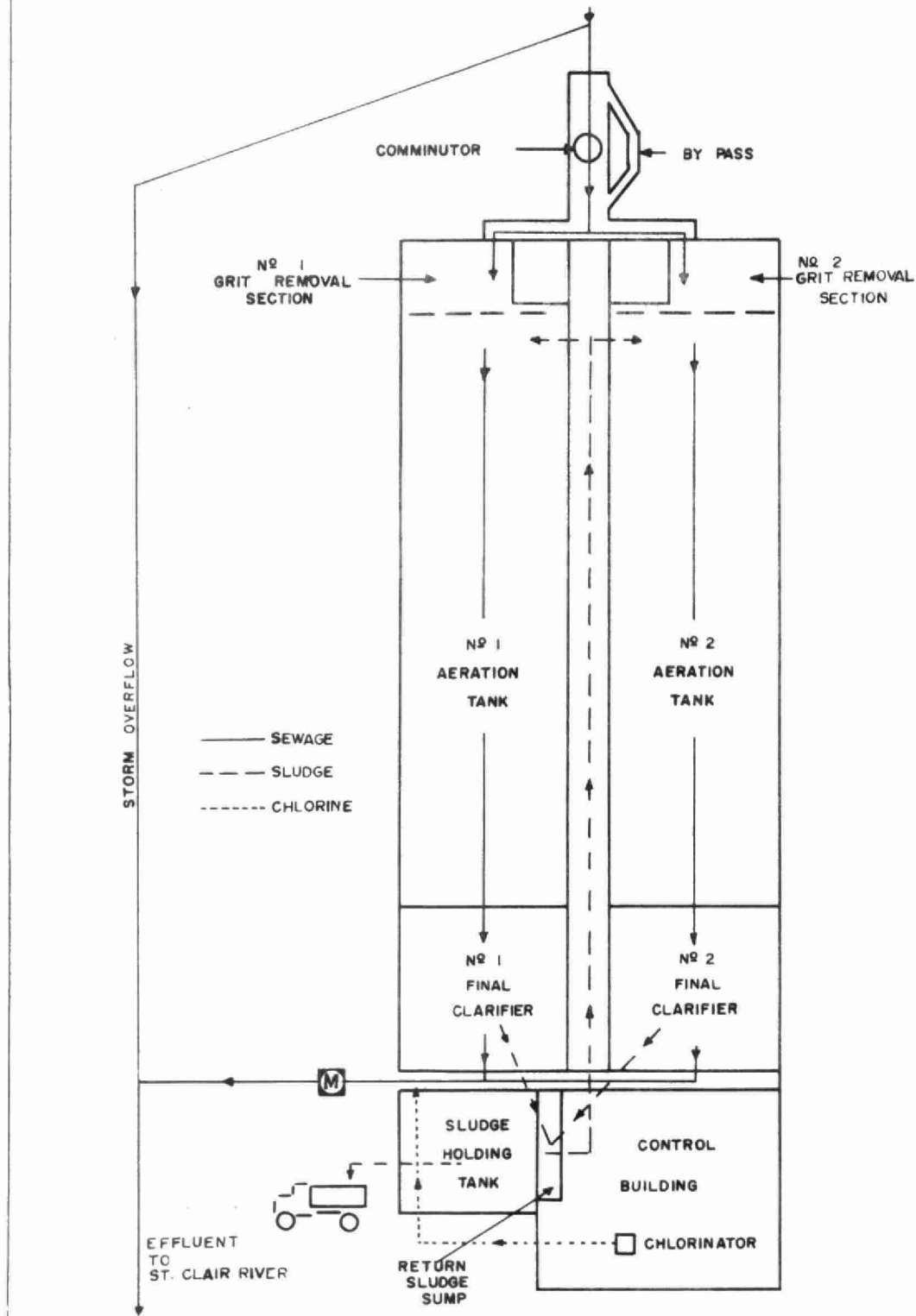
THE TOWNSHIP OF MOORE

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY

MOORE TOWNSHIP (CORUNNA) WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.	2-0088-61	TREATMENT	Extended Aeration
DESIGN FLOW	0.32 mgd	DESIGN POPULATION	4,000
BOD - Raw Sewage	150 mg/l	SS - Raw Sewage	150 mg/l
- Removal	90-95%	- Removal	90-95%

PRETREATMENT

Comminution

Type: Worthington comminutor
Size: One Model 15-C-4

Grit Removal

Type: C. P. Aer-Degritter with air lift
Size: 3780 gal
Retention: 17 min

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air, Single pass
Size: Two 84' x 17' x 14.25' (avg)
(40,698 cu ft or 254,000 gal)
Retention: 24.0 hours

Air Supply

Type: Sutorbilt
Size: Two 1000 cfm

Diffusers

Type: C. P. Spargers
Spacing: 22 per tank @ 20" c-c

Secondary Sedimentation

Type: Dorr
Size: Two 22' x 22' x 12½' swd
(75,300 gal)
Retention: 5.7 hours
Loading: Surface, 330 gal/ft²/day
Weir, 2,350 gal/ft/day

CHLORINATION

Type: W & T, Manual
Size: One 100 lb/day

Chlorine Contact Chamber

- in outfall

OUTFALL

196' of 48" dia corrugated pipe to
St. Clair River

SLUDGE HANDLING

Type: Sludge holding tank (decanted)
Size: One 17' x 17' x 15' (23,000 gal
@ 12.8' depth)

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	.13	—	3.85	—
High	.24	May	4.52	May
Low	.09	July & August	3.35	August

GENERAL

The Moore Township Water Pollution Control Plant is of the extended aeration type rated at 0.32 mgd. Screening, comminution, grit removal, aeration, settling, chlorination, waste sludge storage and truck loading facilities are provided.

The plant is located on the St. Clair River, upstream and upwind of the Police Village of Corunna, which it serves. Also included in the project is a complete sewer system and two pumping stations equipped with submersible pumps. Only one half of the aeration section is now being used for treatment. The additional capacity is held in reserve for storage of storm flows.

During 1970 the plant was very well run, and no major operating difficulties were experienced.

EXPENDITURES

The total operating cost for 1970 was \$18,529.81, an increase of 13% over 1969. The cost per million gallons treated was \$400.90 and the cost per pound of BOD removed was 24 cents. The increase was due to increased sludge handling costs.

PLANT FLOWS and CHLORINATION

During 1970, a total of 46.22 million gallons was treated at the plant, representing an increase of 3% over 1969. Based on the May average, the plant operated at 46% of design capacity. Using the yearly average flow the plant operated at 40% of design capacity.

Chlorination of the final effluent is carried out year-round. An average of 320 pounds of chlorine per month was required for an average dosage rate of 8.1 milligrams per litre to maintain a residual of at least 0.5 mg/l.

PLANT EFFICIENCY

There was a decrease in the BOD and suspended solids concentrations to 153 mg/l and 142 mg/l from 1969 values. This decrease is reflected in slightly lower concentrations in the final effluent. The percentage removal was 95 and 94, resulting in a removal of 67,500 lbs. of BOD and 61,700 lbs. of suspended solids. Average grit removal quantities of nine cubic feet per month have not changed appreciably in the past three years.

SLUDGE DISPOSAL

The 436,000 gallons of waste sludge pumped to the holding tank were reduced to 100,400 gallons by aeration and decanting. An average of 8,400 gallons of sludge per month was hauled away by truck for disposal.

AERATION

In 1970, the MLSS was held within the range of 5,500 to 8,000 mg/l. A comparison of the effluent BOD and suspended solids with the MLSS concentration continued to indicate that best treatment is obtained when the MLSS are kept high.

The amount of air used for each pound of BOD removed was 7,500 cubic feet, unchanged during the past few years.

CONCLUSIONS

During the past year, a highly efficient treatment was maintained. The structures, equipment and grounds were well cared for and no serious breakdowns were encountered.

Because this plant is operating at a hydraulic load factor of 0.40, expansion is not expected for a good many years if the rate of growth does not change.

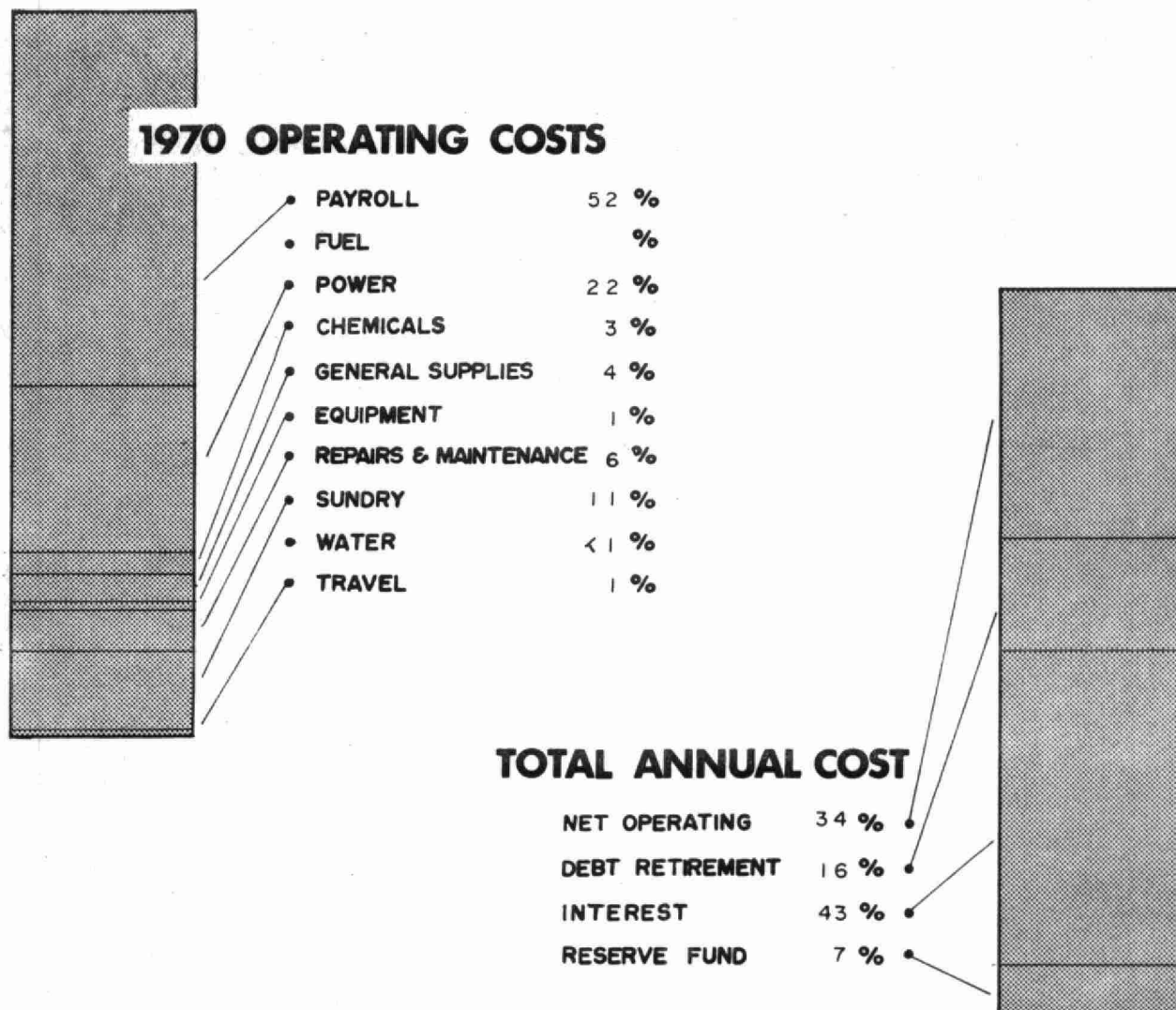
PROJECT COSTS

NET CAPITAL COST (Final)	\$762,209.92
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>335,710.16</u>
Long Term Debt to OWRC	<u>\$426,499.76</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	\$ <u>78,358.65</u>
Net Operating	\$ 18,529.81
Debt Retirement	8,607.00
Reserve	3,908.50
Interest Charged	<u>23,895.17</u>
TOTAL	\$ <u>54,940.48</u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 21,051.85
Deposited by Municipality	3,908.50
Interest Earned	<u>1,453.29</u>
	\$ 26,413.64
Less Expenditures	<u>-</u>
Balance @ December 31, 1970	\$ <u>26,413.64</u>

1970 OPERATING COSTS



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	31.10	\$11,851.63	\$381.06	24 cents
1967	42.49	14,853.48	349.61	24 cents
1968	39.94	16,554.63	414.49	21 cents
1969	44.81	16,333.25	364.50	22 cents
1970	46.27	18,529.81	400.90	27 cents

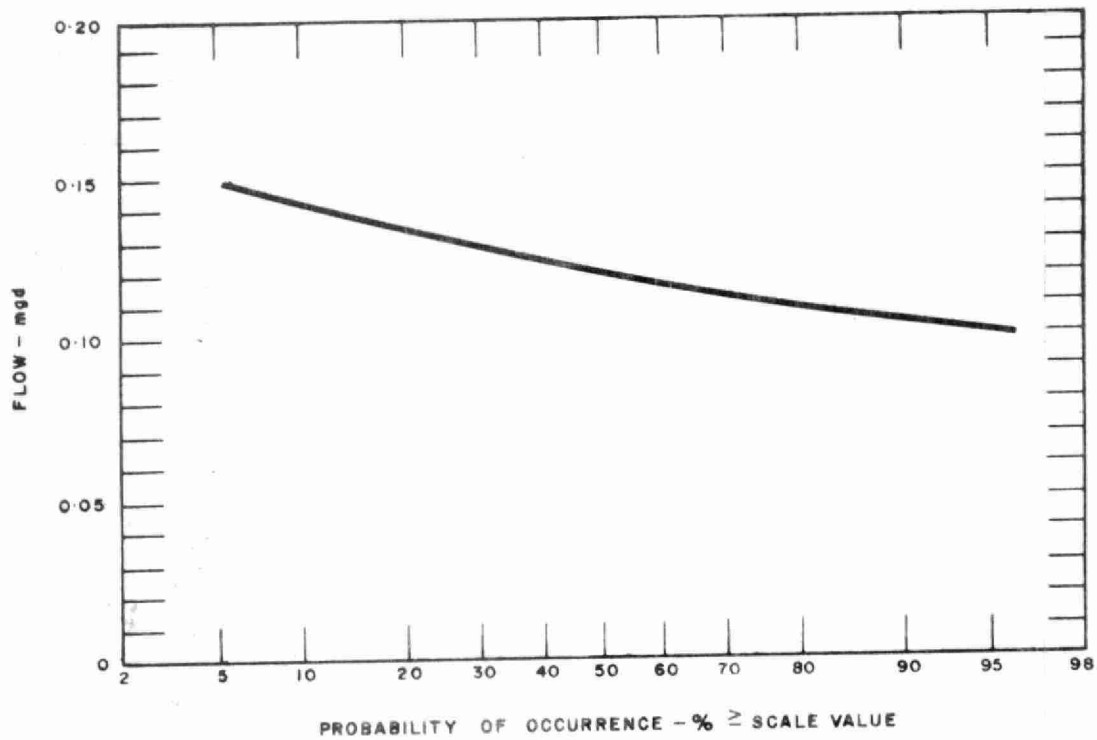
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	1423.56	937.73	12.00	-	348.04	-	6.00	-	27.75	15.78	27.38	48.88
FEB	1265.74	699.60	32.23	-	314.28	-	73.96	-	-	145.67	-	-
MAR	1364.92	748.22	-	-	350.44	-	6.00	182.17	60.00	18.09	-	-
APR	1324.79	712.87	28.00	-	339.08	-	58.41	-	-	151.47	34.96	-
MAY	1712.81	792.81	107.24	-	313.66	-	68.02	-	221.05	210.03	-	-
JUNE	805.55	691.34	48.30	-	-	-	47.14	-	-	18.77	-	-
JULY	2035.81	663.01	187.90	-	650.93	-	63.03	-	233.00	230.06	7.88	-
AUG	1976.57	971.80	172.57	-	319.98	-	88.21	-	223.27	200.74	-	-
SEPT	1869.95	661.76	24.00	-	371.77	-	72.59	38.72	236.00	465.11	-	-
OCT	1361.74	659.06	137.43	-	376.28	-	28.85	-	-	25.96	8.66	125.50
NOV	2016.53	738.56	-	-	382.28	407.55	67.28	-	30.60	390.26	-	-
DEC	1371.84	662.26	-	-	395.80	56.70	92.07	-	51.83	75.40	27.38	10.40
TOTAL	18529.81	8939.02	749.67	-	4162.54	464.25	671.56	220.89	1083.50	1947.34	106.26	184.78

BRACKETS INDICATE CREDIT

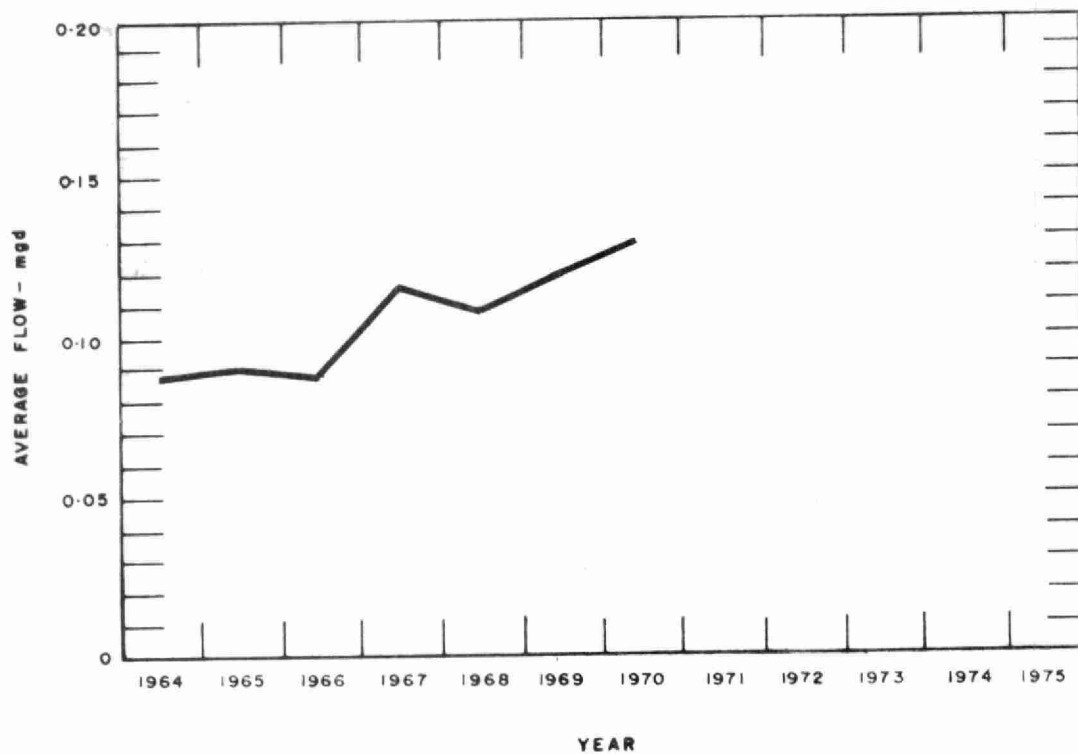
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$1,513.00

PROCESS DATA



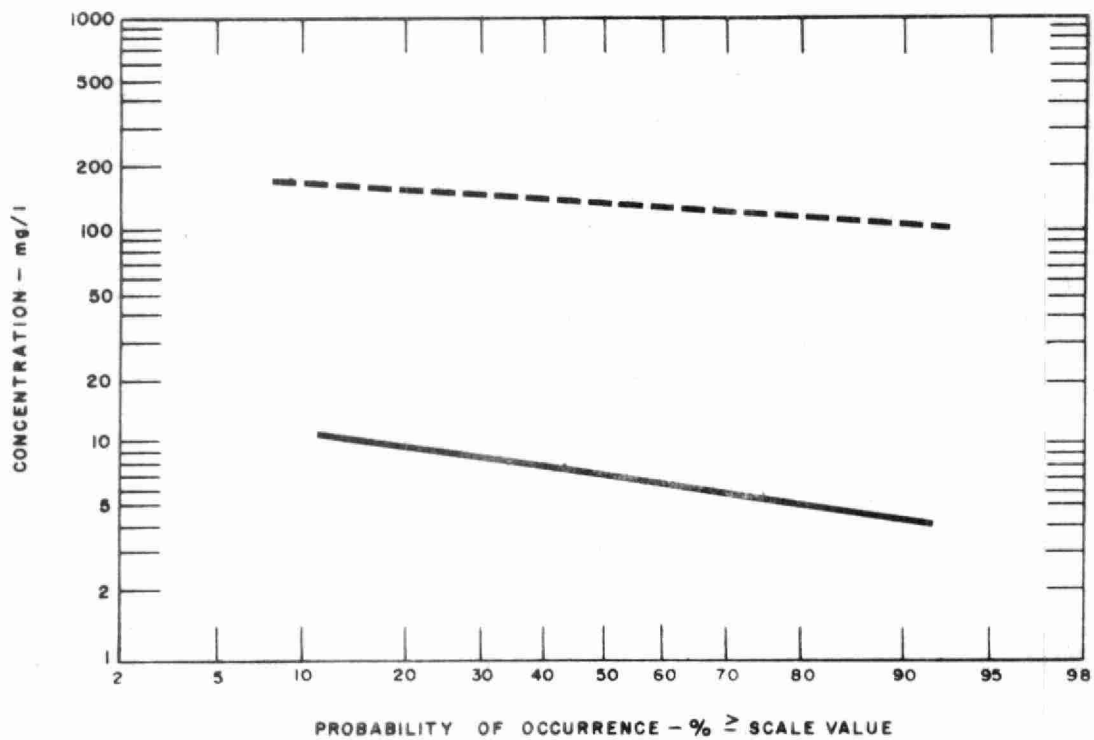
FLAWS

NOMINAL CAPACITY 0.32 M.G.D.

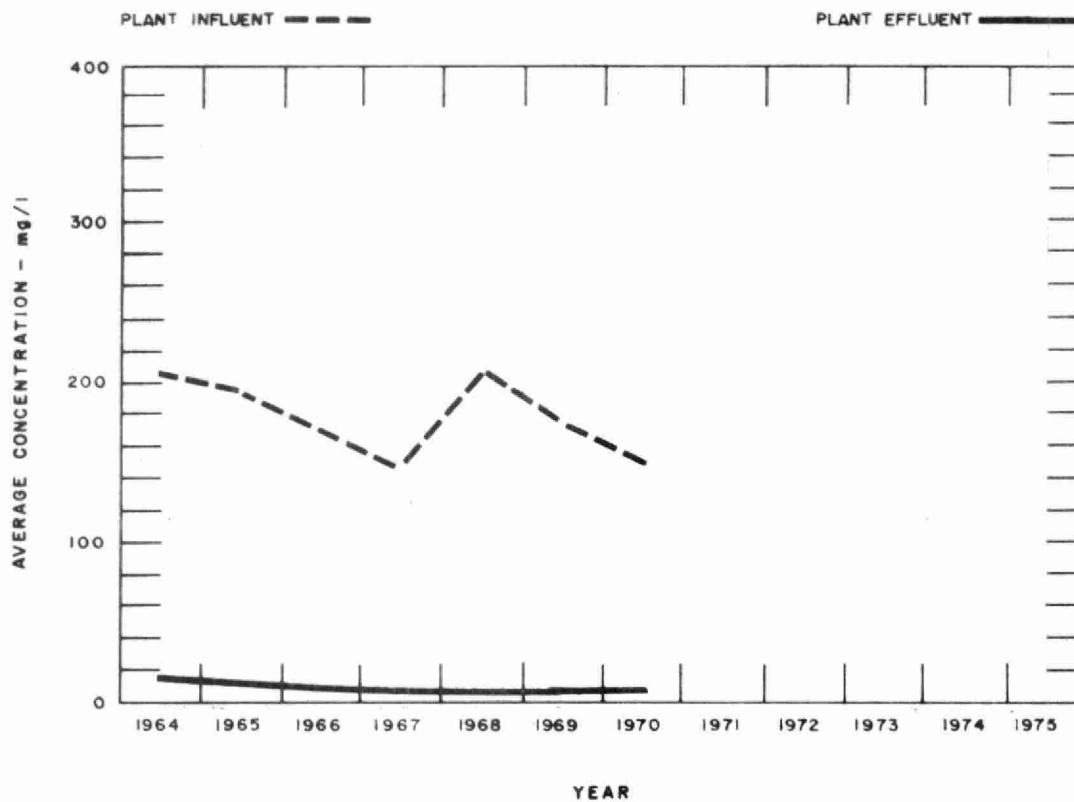


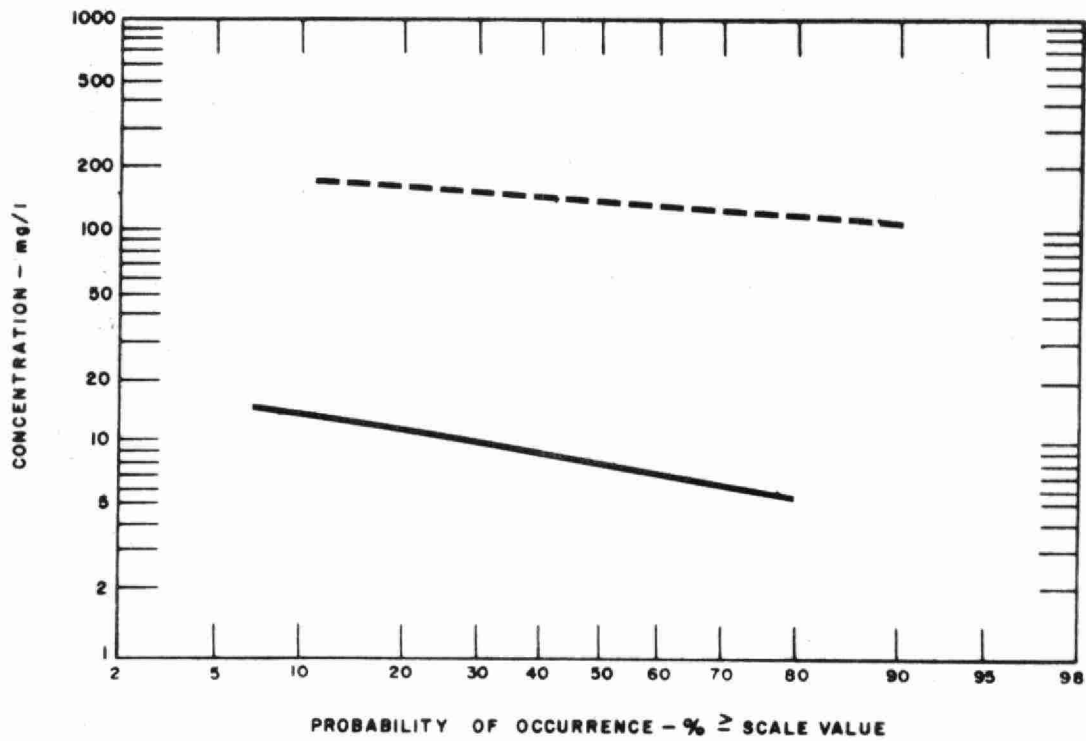
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	3.86	.13	1.6	.11	310	7.9
FEB	3.92	.14	1.8	1.3	280	7.1
MAR	4.36	.14	.20	.11	310	7.1
APR	4.26	.14	.20	.11	300	7.1
MAY	4.52	.15	2.4	.12	310	6.9
JUNE	3.83	.13	1.8	1.0	300	7.8
JULY	3.81	.12	.17	.09	310	8.1
AUG	3.35	.11	.12	.09	420	12.5
SEPT	3.42	.11	.15	.10	380	11.1
OCT	3.52	.11	.15	.10	310	8.8
NOV	3.55	.12	1.9	1.0	300	8.4
DEC	3.82	.12	.15	.11	310	8.1
TOTAL	46.22	-	-	-	3840	-
AVERAGE	-	.13	-	-	320	8.1

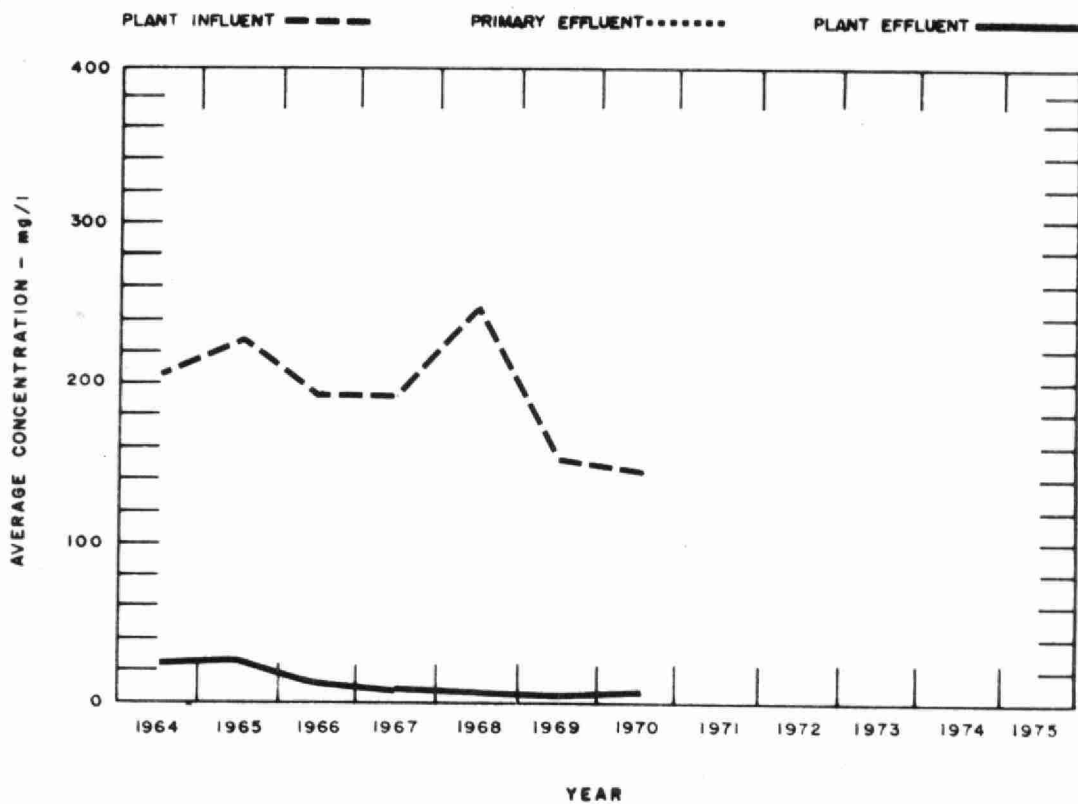


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	6	183	6	7	96	6.8	6	151	6	8	95	5.5	8
FEB	6	152	6	7	95	5.7	6	130	6	6	95	4.9	8
MAR	7	149	7	5	97	6.3	7	141	7	6	96	5.9	9
APR	6	137	6	9	93	5.5	6	126	6	9	93	5.0	8
MAY	6	155	6	9	94	6.6	6	134	6	9	93	5.7	9
JUNE	7	160	7	9	94	5.8	7	152	7	11	93	5.4	9
JULY	6	147	7	9	94	5.3	6	161	7	9	94	5.9	9
AUG	6	171	6	6	96	5.5	6	144	6	8	94	4.6	9
SEPT	7	147	7	7	95	4.8	7	142	7	7	95	4.6	8
OCT	6	140	6	5	96	4.8	6	137	6	7	95	4.6	9
NOV	6	138	6	5	96	4.7	6	135	6	10	93	4.4	9
DEC	8	157	8	7	96	5.7	8	147	8	11	93	5.2	8
TOTAL	77	-	78	-	-	67.5	77	-	78	-	-	61.7	103
AVERAGE	-	153*	-	7*	95	5.6	-	142*	-	8*	94	5.1	9

NOTE - n is the number of samples taken

* - Weighted Average

SLUDGE DISPOSAL

Month	Sludge to Holding Tank (10 ⁴ Gals.)	Sludge Disposal (10 ⁴ Gals.)
January	3.30	1.08
February	2.60	-
March	3.80	1.08
April	6.10	-
May	7.80	1.21
June	1.30	1.08
July	1.80	1.38
August	2.00	-
September	4.60	1.24
October	6.50	1.40
November	-	-
December	3.80	1.57
TOTAL	43.60	10.04
AVERAGE	3.63	0.84

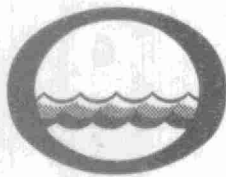
AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD	WASTE SLUDGE lb/DAY
		BOD	SS	BOD	SS				
		mg/l	CONCN mg/l	mg/l	CONCN mg/l				
JAN	.13	183	151	7	8	7930	.02	5.2	-
FEB	.14	152	130	7	6	7980	.02	5.6	-
MAR	.14	149	141	5	6	8080	.02	5.0	-
APR	.14	137	126	9	9	7730	.02	7.9	-
MAY	.15	155	134	9	9	6620	.02	6.8	-
JUNE	.13	160	152	9	11	5840	.02	7.5	-
JULY	.12	147	161	9	9	5650	.02	8.5	-
AUG	.11	171	144	6	8	6050	.02	8.1	-
SEPT	.11	147	142	7	7	6820	.02	9.0	-
OCT	.11	140	137	5	7	6820	.02	9.4	-
NOV	.12	138	135	5	10	5760	.02	9.2	-
DEC	.12	157	147	7	11	6820	.02	7.8	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.13	153	142	7	8	6840	.02	7.5	-

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